

REMARKS

Claims 1-6 remain pending in this application with claim 1 being amended by this Response.

Rejection of claims 1, 2, 4 and 5 rejected under 35 U.S.C. 103(a)

Claims 1, 2, 4 and 5 rejected under 35 U.S.C. 103 (a) as being unpatentable over Launey et al. in view of Matsuo in view of Kostka et al. and further in view of Thrift et al.

The present claimed invention recites a voice control system for a consumer electronics device with one or more external loudspeakers, using a microphone array. The voice control system includes a plurality of microphones for converting a detected signal to electrical signals, wherein one or more microphones are integrated in the external loudspeakers. A central signal processing unit is connected to the plurality of microphones. The signal processing unit scales or processes the electrical signals received from the plurality of microphones according to the respective position of the microphones relative to the user. The respective position is given by different propagation delays. A central speech recognition unit converts the electrical signals from the signal processing unit into operational commands for the consumer electronics device.

Launey et al. teaches a voice control system for a home automation system which may include consumer electronic devices, one or more remote speakers and a plurality of remote microphones. The plurality of microphones are uncorrelated, i.e. each converting signals detected at different locations to electrical signals. The system taught by Launey et al. also includes a central processor and a speech processor. However, the central processor used by Launey's system is completely unlike the central signal processing unit of the present claimed invention. In fact, the central signal processing unit of the present claimed invention is neither disclosed nor suggested by

Launey et al. as explained hereinbelow and depicted in the enclosed juxtaposition of the relevant components of Launey et al. and the present claimed invention. The attached Figure is provided for purposes of explanation to show the distinctions between the present claimed invention and the system of Launey et al.

As can be seen from Figure 1 of Launey et al., the central processor, identified by the reference numeral "10", is not directly connected to the plurality of microphones, identified by the reference numeral "64", and therefore is not suitable for processing the electrical output signals of the microphones according to the respective position of the microphone relative to the user as in the present claimed invention. Instead, the central processor 10 is connected to the speech processor 58 as shown in the attached drawing. This is due to the fact that the central processor 10 performs a task different than that of the processor of the present claimed invention, namely "to either control each of the subsystems automated within the home environment, or to transmit or receive either data or instructions from within the home environment" (see col.7, lines 59- 62). Thus, the central processor employed by Launey et al. can process instructions, but not raw signals such as output signals of microphones as in the present claimed invention.

In both the present claimed invention and the system of Launey et al., the general technical term "signal processing unit" is commonly used, but with different meanings, e.g., the signal processing unit that is employed in the current application will usually have an analog type of interface towards the microphones, and may process the microphone signals in analog or digital form. In the system of Launey et al., the signal processing unit will comprise an analog-to-digital converter. Additionally, in the system of Launey et al., it appears that the speech processor 58 has the analog type of interface towards the microphones, while the signal processing unit 10 is a central processor, e.g. an AT compatible 80286 (col. 13, lines 8-9), which is a purely digital device.

Likewise, Fig.1 of Launey et al. shows that the speech processor referenced as "58", is connected to the remote microphones. Launey specifies in col.13, lines 19-28,

that the speech processor 58 may preferably be embodied by one or more Texas Instruments TISPEECH speech processing boards, and that each TISPEECH board is connected to a single microphone 64. It may therefore convert the electrical signals from one of the microphones 64 but not the electrical signals from the signal processor 10 into operational commands, as in the present claimed invention.

Fig. 1 of the present claimed invention shows that, in the inventive voice control system, the microphones are connected to a signal processing unit, which correlates the microphone signals and which is therefore not comparable to the central processor 10 of the system of Launey et al., and further that this signal processing unit in turn is connected to a single speech recognition unit. /

For the inventive voice control system for a single consumer electronics device this is a useful configuration. A system according to Launey et al. however would additionally have a central processor for combining e.g. multiple such speech processing units, so that it would be possible to control more than one consumer electronics device. /

Matsuo discloses a microphone array apparatus for detecting the position of a sound source, emphasize the source and suppress noise. The apparatus includes a plurality of microphones, filters for receiving the outputs of the microphones and a filter coefficient calculator. As admitted by the Examiner, Matsuo neither discloses nor suggests "a plurality of microphones ... wherein one or more microphones are integrated in said external loudspeakers" as in the present claimed invention. Additionally, Matsuo neither discloses nor suggests "a central speech recognition unit for converting the electrical signals from said signal processing unit into operational commands for the consumer electronics device" as in the present claimed invention. Matsuo is only concerned with reproducing the sound captured by the microphone.

Kostka et al. recites a method and device for acoustically commanding an elevator installation. Kostka et al. uses a remote input device including a display and a keyboard and an audio unit for acoustically inputting data. The audio unit also includes

a loudspeaker for reproducing the acoustic data received by the audio unit. Kostka et al. neither disclose nor suggest “a plurality of microphones ... wherein one or more microphones are integrated in said external loudspeakers” as in the present claimed invention. In Kostka et al., the microphone and loudspeaker are interconnected whereby the loudspeaker reproduces the acoustic signal received by the microphone. Additionally, as the microphone and loudspeaker are both included in a handheld remote device, Kostka et al. would have no reason nor would it be feasible to include more than one microphone as in the present claimed invention. The purpose of Kostka et al. is very different than that of the present claimed invention. While Kostka et al. is concerned with the privacy of the user, the present claimed invention provides a plurality of microphones to capture acoustic signals from a user within a wide region. The placement of the acoustic signal received by the microphone and the microphone in Kostka et al. is due to the size of the handheld device to which the acoustic signals are directed. The acoustic signal received by the microphone is fed to an audio transducer and converted into a digital signal, the digital signal is then processed and/or converted to an analog signal for reproduction by the loudspeaker. Kostka et al. also neither disclose nor suggest “a central signal processing unit being connected to the plurality of microphones, the signal processing unit scaling or processing the electrical signals received from the plurality of microphones according to the respective position of the microphones relative to the user, the respective position being given by different propagation delays” as in the present claimed invention. As Kostka et al. only include a single microphone, there is no reason to process the electrical signals according to the respective positions of the microphones as in the present claimed invention.

Thrift et al. recites a voice-activated device for controlling a processor based system. Similarly to Kostka et al. Thrift et al. includes a hand held device for wirelessly transmitting a control signal to a host system. Thrift et al. disclose that a microphone array may be used to enhance the ability of differentiating between the user's voice and other sounds. However, the microphones forming the microphone array are all contained within the hand held device and thus, Thrift et al. neither disclose nor suggest ““a central signal processing unit being connected to the plurality of microphones, the signal processing unit scaling or processing the electrical signals

received from the plurality of microphones according to the respective position of the microphones relative to the user, the respective position being given by different propagation delays” as in the present claimed invention. As the microphones of the microphone array are included in a handheld remote device, Thrift et al. would have no reason to consider the respective positions of the microphones relative to the user based upon different propagation delays as in the present claimed invention. The purpose of the microphone arrays of Thrift et al. is very different than the microphone array of the present claimed invention. The microphone array of Thrift et al. is to minimize interference. As the present invention includes a microphone array covering a wide area, the purpose is to ensure capturing of the voice signals from the user and determine the position of the user. As the user is holding the microphone array in the system of Thrift et al., there is no need to ensure capturing of the voice signals from the user as the user speaks into the microphone array nor is there any reason to determine the position of the user with respect to the position of the microphones of the array.

In addition to the above remarks, applicants respectfully submit that it is not proper to combine the references cited by the Examiner in this rejection as each is provided for solving different problems and performing different functions. Launey et al. is provided for controlling a home automation system. Matsuo is provided for receiving an acoustic signal and emphasizing the received signal while minimizing noise signals prior to reproducing the received signal. Kostka et al. and Thrift et al. are directed to handheld device for individual use, the microphone or microphone array being contained within a handheld housing. Though each of these systems include microphones for capturing audible signals, they all perform different functions and are directed to solving different problems. Applicant respectfully submits that combining these references in the manner done by the Examiner amounts to picking and choosing specific features of each reference and not considering the references as a whole. Thus, it is respectfully submitted that it is not proper to combine these references and even if it were proper to combine these references, the combination would not produce the present claimed invention.

In view of the above remarks and amendments to claim 1, it is respectfully submitted that the present claimed invention as recited in claim 1 is not unpatentable over the combination of Launey et al., Matsuo, Kostka et al. and Thrift et al. when taken alone or in any combination. As claims 2, 4 and 5 are dependent on claim 1 it is respectfully submitted that these claims are allowable for the same reasons discussed above concerning claim 1. It is thus further respectfully submitted that this rejection is satisfied and should be withdrawn.

Rejection of claim 3 under 35 U.S.C. 103(a)

Claim 3 stands rejected under 35 U.S.C. 103 (a) as being unpatentable over Launey et al. in view of Matsuo in view of Kostka et al. in view of Thrift et al. and further in view of Lea.

Lea recites a home audio visual network defining an open architecture for interoperating consumer electronic devices. The architecture allows for devices from different manufacturers to interoperate. Lea was cited to show a bi-directional network based on an IEEE 1394 bus. However, Lea neither discloses nor suggests the enhanced voice control system using a microphone array of the present claimed invention.

In view of the above remarks and amendments to claim 1, it is respectfully submitted that Lea adds nothing when taken alone or in combination with Launey et al., Matsuo, Kostka et al. and Thrift et al. that would make the present claimed invention unpatentable. It is thus further respectfully submitted that this rejection is satisfied and should be withdrawn.

Rejection of claim 3 under 35 U.S.C. 103(a)

Claim 3 stands rejected under 35 U.S.C. 103 (a) as being unpatentable over Launey et al. in view of Matsuo in view of Kostka et al. in view of Thrift et al. and further in view of Abe et al.

Abe et al. was cited to show a wireless loudspeaker. Abe et al. recites a wireless receiver for receiving an infrared radiation modulated by an audio signal. However, Abe et al. is not concerned with voice control systems as in the present claimed invention. Abe et al. neither disclose nor suggest "a microphone array... a plurality of microphones for converting a detected signal to electrical signals, wherein one or more microphones are integrated in said external loudspeakers" as in the present claimed invention. Abe et al. is only concerned with a loudspeaker able to receive wirelessly transmitted signals. Abe et al. also neither disclose nor suggest "a central signal processing unit being connected to the plurality of microphones, the signal processing unit scaling or processing the electrical signals received from the plurality of microphones according to the respective position of the microphones relative to the user, the respective position being given by different propagation delays" as in the present claimed invention. Furthermore, Abe et al. neither disclose nor suggest "a central speech recognition unit for converting the electrical signals from said signal processing unit into operational commands for the consumer electronics device" as in the present claimed invention.

In view of the above remarks and amendments to claim 1, it is respectfully submitted that Abe et al. adds nothing when taken alone or in combination with Launey et al., Matsuo, Kostka et al. and Thrift et al. that would make the present claimed invention unpatentable. It is thus further respectfully submitted that this rejection is satisfied and should be withdrawn.

Since the present claims set forth the present invention patentably and distinctly, and are not taught by the cited art either taken alone or in combination, this response is believed to place this case in condition for allowance and the Examiner is respectfully requested to reconsider the matter, and to allow all of the claims in this case.

Should the Examiner feel that anything further is necessary to place this application in condition for allowance he is respectfully requested to contact applicants attorney at the telephone number listed below.

Application No. 09/660,381

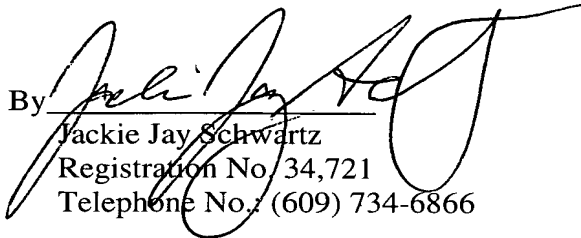
Attorney Docket No. PD990065

No fee is believed due with this response. However, if a fee is due, please charge the additional fee to Deposit Account 07-0832.

In view of all of the foregoing, it is submitted that the amended application is now in condition for allowance, and such action is respectfully requested.

Respectfully submitted,
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